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DEC 11 2008
PATENT & TRADEMARK OFFICE

Respectfully submitted

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Patent Application of

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for

MANIPULATION OF RNA STABILITY AND PROTEIN SYNTHESIS IN CELLS USING THIO-PHOSPHATE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This is a division of Ser. Nr. 10/007,489, Filed Dec. 5, 2001. Thio-phosphate can be used as a feed source substituting for phosphate to chemically modify nucleic acids in vivo. Cells incubated in thio-phosphate containing media incorporate the modified phosphate into the backbone of RNA resulting in RNA modified with nuclease resistant phosphorothioate linkages. The extent of thio-phosphate substitution can be varied by varying the ratio of thio-phosphate to phosphate in the culture media. Cells grown in fully substituted thio-phosphate media generate higher yields of mRNA per cell. The consequences for cells are both profound and subtle allowing for continued growth and viability over several generations.